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Nuclear Regulatory Oversight  
Commisisoner Nils J. Diaz  
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Good afternoon. I am very pleased to have the opportunity to address the 1997 NRC Regulatory Information Conference, my first but hopefully not my last. At this time, you all have been properly welcomed, the expectations for the meeting are established, and everyone is winding down. Therefore, my first obligation is to make sure you are all awake and listening. This was easy for me before I joined the Commission in August of 1996. I used very simple techniques to do this.....

However, I have to relinquish all these and rely on your interest and a few provocative comments.

My fellow Commissioners, members of the Nuclear Regulatory Commission staff, industry representatives and distinguished guests.

### CONGRATULATIONS

By any objective, practical measure nuclear industries in the U. S. are much safer today than at any other time. This is particularly noticeable from comparative analysis of safety indicators such as those shown below. The key one is radiological exposure from nuclear power plants as a function of time.

This is indeed an achievement that reflects the combined efforts of licensees and the NRC to reduce radiological impacts on workers and the general public to negligible quantities. It demonstrates that the focus on operational safety by both the NRC and licensees has paid off with minimal occupational and public radiation exposures, the key yardstick for determination of safety in our business. Yet, we all know that the facts are not widely recognized or accepted. We need to improve our image and credibility, with consistently safe performance communicated to the public, for these facts to be widely accepted.

In contrast to exposures as a result of nuclear power plant operation, the much larger exposures and radiological risks from the use of radioactive materials in medicine are safely shielded by the real and perceived benefits of such procedures. The nuclear power industry has no such shield because its benefits are not so clearly perceived. For this reason, nuclear power is often held to a higher standard. It has to be better than good, and it is better. While this may seem obvious to those of you in this room, it is a conclusion that would astound most members of the public. This is an issue that I will touch briefly on later.

Now that I have you concerned about whether you can afford to nap or not, let me preface the rest of my remarks by quick historical notes of a personal nature, that will be followed by a few fundamental observations about the regulatory domain. I have been involved in a variety of capacities in the civilian and non-weapons military uses of nuclear energy for more than three decades, including more than 25 years as an entrepreneur, consultant, owner, or co-owner of six small firms in the nuclear or radiation-related business. For most of that period, I was simultaneously a professor of Nuclear Engineering at the University of Florida, where I spent about half of my time. From 1985 until 1996 when I joined the Commission, I was also director of a national, and later an international consortium of industries, universities and national labs conducting multi-disciplinary research on nuclear space power and propulsion for DOD's Strategic Defense Initiative, now the Ballistic Missile Defense Organization. There were also a dozen years in there -- 1971 to 1983 -- during which I held an NRC Senior Reactor Operator's license. Because of these various roles, I am encountering many familiar faces in the discharge of my duties as an NRC Commissioner, and I want to thank you for the warm welcome I have been experiencing.

My joining the Commission in 1996 marks the first time since coming to the United States in 1961 that I have been exclusively a public servant. There is a qualitative difference, I believe, between service in the public sector and work in either the private sector or academia. Those of us who are part of the Government, regardless of our previous affiliations, have a single client, and that is the American people. As public servants in a democracy, we have an overarching objective; to contribute to the quality of life of our country's people, now and in the future.

Let me interject at this moment that part of my own history is the experience of having lived under undemocratic governments, where diversity of viewpoint and the free expression of ideas were not tolerated; on the contrary, they were seen as threats against the state. Living under such conditions is not an experience I would recommend to anyone, but it does have one, and only one, positive aspect: it gives you the keenest possible appreciation for this country's democratic institutions, including such basic human rights as freedom of thought and speech. If there are any Americans who take those rights for granted, it is only because they have never known what it is to be without them. I fully agree with Vice President Gore, who during his recent trip to China said, "Americans ... believe that the freedom to inquire and debate and, when necessary, to challenge existing institutions and habits of thought is the key to creating the world that I just described. The world he was describing is a free world. He went on to say that "[w]e also believe that economic freedom and political freedom ultimately are linked. As Ronald Reagan said, "We [the U.S.A.] welcome change and openness; for we believe that freedom and security go together, that the advance of human liberty can only strengthen the cause of world peace." I cherish this country's democratic system and feel honored to serve its people.

I see the NRC as a democratic institution within the world's greatest democracy, where the free expression of ideas, and the candid exchange of different viewpoints, are an integral part of doing the job. Congress must have believed that the interplay of diverse points of view was desirable in the regulation of nuclear energy when they chose the five-member Commission format to discharge the U.S. Government responsibilities in this key

area. And I feel privileged to serve with my fellow Commissioners and the staff in this institution.

In that spirit, I'd like to offer today my own views of what my duties mean to me, in practical terms: how I see the Commission's obligations to the American people, and where I think the agency should be placing a few of its priorities, given that resources are limited. In other words, my views of the NRC regulatory oversight. These will not be earth-shattering revelations, but I want to convey a few fundamental observations and recommendations from my experiences during the last 7 months, all of which are tempered by my previous experience.

First, the NRC and the industry it regulates have achieved the maturity needed to more effectively and efficiently conduct their operations, within a better defined regulatory infrastructure. The almost 50 years of learning and "lessons-learned"; the experiences, improvements in methods, techniques, equipment, and informatics; and the risk-informed enhancement of operational safety can, and should be integrated into a state-of-the-art regulatory infrastructure, to achieve necessary safety performance with appropriate regulatory relief. The real challenge is no longer in learning, although we must continue to learn, but in how to apply and use this enormous data base of knowledge; and to use it now. For instance, we still have too many uncertainties in our regulations and their implementation. This is because our regulations were developed over time in a less than systematic fashion and with too much patch-work. These uncertainties affect regulatory burden, encumber the regulator, and inhibit public understanding. The removal of these uncertainties might appear to be impossible tasks, but in reality it is quite feasible now, because the "state-of-the-art" is very advanced. Both the industry and NRC have excellent personnel and tools to effect change. The know-how is within our grasp, if we are bold enough to use it. A bit of explanation is in order.

The NRC's mandate, according to the Atomic Energy Act, is to "minimize danger to life or property," and ensure "adequate protection" of the health and safety of the public. As the NRC explained in the Safety Philosophy published last year, the term "adequate protection" is not defined in the Atomic Energy Act, nor is it self-defining. This means that the Commission itself, with oversight by Congress and occasional guidance from the courts, has had the task of developing the policies, regulations, decisions, and practices that together embody the NRC's safety philosophy. This process of defining and redefining "adequate protection" is evolutionary; each successive team of Commissioners, with the support of the staff, has the opportunity to make refinements and amendments in policy and in philosophy due to changes in the circumstances, and to take advantage of the varied experience and perspective of each new Commissioner. Based on present "state-of-the-art", it is possible and necessary to re-evaluate the regulations embodied in 10 CFR, and in Part 50 specifically, to eliminate inconsistencies, and in particular, add the new knowledge-base and risk-information to ensure adequate protection of the health and safety of workers and the public, while eliminating unnecessary regulatory burden. This will require a level of cooperation between the regulator and regulated community that would have been difficult to realize before the capabilities and openness brought by the information age.

My own strong view is that the governmental process is a two-way street. Our sharp

focus on the obligations of the regulated community to operate its facilities safely must be matched by a focus every bit as sharp on the NRC's own obligation to conduct its regulatory program rationally and efficiently. The regulatory process, to be successful, must bring "value-added," as measured in the quality of life of the American people. The test must be: does this regulation, or program, or policy contribute to the quality of life of the public? That question has its obvious corollary; whether the quality of life of the American public would suffer if a particular regulation, program, or policy did not exist.

Simply put, there has to be "value-added" to society by the industry, and "value-added" by the regulatory process. For the nuclear industry, still clouded in a mantle of fear and lack of understanding, clearly perceived "value-added" is a must, as it is for the NRC, because our respective roles are often misinterpreted. In comparison, everyone is aware of the "value-added" by medical uses of radiation. Yet, regulatory burden can make medical procedures so difficult, and consequently so expensive, that their value may be lost. The same can be said of nuclear power. The value-added by the 23% of electrical generation by the nuclear industry to the economy, to national security and to the environment is generally lost in the controversy surrounding the technology; its value to our society needs to be better established.

The NRC confers "value-added" on society when its regulatory activities improve the safety of nuclear power plants, and as a result of this, their efficiency. This contribution is also often obscured from the public. However, the public understanding of NRC's role can be enhanced when we regulate not only effectively, but with efficiency, clarity and emphasis on public information.

I believe that efficient nuclear power and effective NRC regulation provide significant value-added to society and contribute to our quality of life. Let me make clear however, that I am not for a moment suggesting that an unsafe plant should be allowed to operate, in the interest of need for power, survival of the nuclear industry, bonds rating, or anything else. What I am suggesting is that, at this point in the maturity both of the nuclear industry and of the NRC, we have learned enough to enhance the value of these plants to society by improving their safety and efficiency, and that the issue now is how best to accomplish that goal with a fresh look at the regulatory infrastructure. In other words, how should the NRC discharge its responsibilities in a world of finite resources, in a way that adds the most value? The recent discussions of the events at Millstone and Maine Yankee, and of the relationship between safety and compliance, give particular urgency to this question.

At the 3 Millstone units, there were several thousand issues to be resolved. A couple hundred of these were identified as restart significant issues, but only a handful appear to have been safety significant. Likewise, Maine Yankee had a few thousand issues in need of resolution, less than a hundred of which were restart issues. Again, only a couple were safety significant. In these cases, NRC was not clear in its efforts to inform the public. We do the American public a disservice when we fail to distinguish clearly between the issues that have significant safety impact and those that do not. Three different communities are affected by this lack of definition; the people of this country, the NRC and its credibility, and the regulated community.

I do not mean to minimize the significance of a plant having several thousand non-safety significant issues, or a hundred significant issues not important to safety. Indeed, it is entirely possible that such an aggregation is in itself a significant safety issue. Nevertheless, I think we have to be very sure that we communicate the safety significance as well as the numbers of issues identified. That means being blunt about safety problems when they exist, but equally straightforward in letting the public know when safety problems do not exist. This is necessary to ensure that NRC's finding of reasonable assurance of adequate public and worker protection is not undermined, when in fact, that finding remains valid.

It is now time for a wake-up call. Safety and compliance, as used by nuclear energy practitioners, are not the same, yet they share a common nature. All safety issues (or safety significant issues) are compliance issues, but most compliance issues are not safety significant issues. For years, NRC and the regulated industry have emphasized "operational safety" because it was the best available approach to ensure adequate protection of workers and the public, given the existing state of knowledge and the resources available. The results have not been bad; no member of the American public has received a radiation dose in excess of applicable dose limits as a result of nuclear power plant operations, as was discussed by Commissioner Dicus earlier. And the limits are extremely conservative. Safety and compliance, as used by the nuclear industry, have different degrees of risk importance; important to safety issues generally have greater radiological risk while what are called compliance issues should pose lower (but not zero) radiological risk. They are both distinct areas of regulatory oversight, or domains, to borrow from the field of mathematics, within the nuclear regulatory oversight. Licensees must abide by all of the requirements within the compliance domain, whether they are safety significant or not. However, NRC should focus its limited resources on those issues with a direct impact on safety.

Whether in a reactor or a nuclear medicine lab, NRC requires that licensees manage, and manage well, the risks associated with the use of radioactive materials. Further, we require that licensees manage radiation under normal circumstances, as well as anticipated occurrences or postulated accidents. Just as licensees manage radiation risks, the NRC regulates the management of radiation risks. This is called regulatory oversight.

Regulatory oversight contains several levels of safety related structures, systems, components and activities. The most obvious of these levels is what I call the compliance domain. The compliance domain can be illustrated as an irregular shape; i.e., it is not a very carefully defined area. All activities that relate directly to radiation risk management and only those activities that relate directly to radiation risk management should be within this domain.

However, we know better than to give the same importance to every component, system, structure, activity, process, or procedure. From the very beginning of the nuclear age, we recognized the importance of focusing on so called safety issues. We spelled out the concept of graded safety importance when the milestone rulemaking "Quality Assurance Requirements for Nuclear Power Plants and Fuel Reprocessing Plants" was issued in 1970, 26 years ago, and specified "Quality ... to an extent consistent with their importance to

safety.” Therefore, the NRC and the regulated industry, jointly established a sacrosanct space within the compliance domain where radiological risks are better known, and quantified; the important to safety domain. An increase in radiological risk is likely to result from failing to perform an important to safety function. A failure to comply with a requirement within the compliance domain, that lies outside the important to safety domain, is unlikely to result in increased radiological risk in and of itself. However, a failure in the compliance domain could increase the consequences of a failure in the important to safety domain.

Although they are commonly separated, important to safety is a subset of compliance. Much effort has been spent on defining the boundary between safety and compliance because licensees’ duties in both areas are mandatory, but somewhat different. The unwritten rule was that by strictly enforcing “safety” we could assure adequate protection since the major risks were inherently considered and many lower safety “compliance issues” would be automatically controlled. The differences deserve a new look, based on today’s know-how.

The portion of the compliance domain that is outside the important to safety domain, constitutes a supporting infrastructure for the “safety significant” issues. It is important to realize that we cannot devote the same attention to every compliance issue that we devote to important to safety issues. NRC must focus its limited resources on issues that have a direct impact on safety. We all know this but how to work with this fundamental common-sense concept after the Millstone era is another issue.

I would like to suggest that we refine the essential definitions within the regulatory domain, how they relate to safety, and then fine-tune the policies and their implementation in terms of 1997 know-how. One possible avenue is to introduce within the safety domain, another smaller, yet sharply defined domain. I call this the risk critical domain. This will introduce a third level of safety. However, it will not add complexity. Indeed, it will simplify the characterization of safety issues and compliance issues.

The risk critical domain is a subset of the important to safety domain. Present know-how has identified those structures, systems, components and procedures that have high potential for radiological risks approaching or exceeding allowable exposures. A solid Level One PRA and present experience can be used to clearly define the boundary between the risk critical and important to safety domains. This boundary should be more sharply defined than the boundary between compliance and safety.

Establishing a risk critical category would allow us to bring risk information into the regulatory process now, without having to wait for a yet to be developed risk informed, performance based process. This logical step will help eliminate the confusion arising from the current ambiguities associated with terms like “safety related,” “safety significant” or “important to safety”. Current state-of-the-art methodologies can be used to separate non-safety significant compliance issues from safety related compliance issues. It is my view that those requirements without a clear nexus to safety should be eliminated. As Chairman Jackson said in her speech yesterday morning that opened this conference. If regulations are not important to safety, they should be revised or eliminated. I strongly support actions

in this respect.

Once we have established a Risk Critical Domain, both regulators and the regulated industry can have a clear understanding of the requirements governing every risk critical system or process and the potential radiological consequences. In my view, failures of performance in the risk critical domain must result in the most severe enforcement, and enforcement commensurate with risk should be applied in the safety and compliance domains. Furthermore, there is one area, where the NRC has no control but the industry has: the good management practices area. Here there is no radiological risk and it is, therefore, outside of the NRC mandate. However, this area can contain many supporting elements of the needed safety infrastructure, and should be well understood by regulator and regulated.

Once you have sorted out the risk-critical issues from the important to safety and compliance issues, increased clarity and consistency can be brought to the regulatory process. This effort could build on the indispensable, yet stagnant foundation provided by Appendices A and B, as well as the new Maintenance Rule. For example, well defined risk critical, important to safety, and compliance domains can be used to resolve the longer-term rulemaking and implementation of a new, revised 10 CFR 50.59, subject to less error, interpretation and application, as well as resulting in a smaller number of modifications requiring prior NRC's review and approval, without negatively impacting safety. Instead of the present determination of unreviewed safety questions, a matrix could be developed whereby a licensee could calculate the changes in core damage frequency and know the corresponding NRC reporting and approval requirements.

Clarity and consistency have been called for with increasing frequency, in rulemakings and in implementation of those. Nowhere is this more important than in the multi-layered structure of the inspection and assessment process. The process needs review. It is old, and no longer fulfills the needs for which it is intended. In the last 20 years, the NRC has too often been event-driven. Our most publicized responses, inspections, assessments and our communications to the American people have been driven by events. It is time to be policy-driven and to assign events their proper safety-significance before we cry wolf. This would require that 21st century systematics and informatics be brought into the inspection and assessment processes. Only this would allow the proper distribution of resources proportional to the radiological risks. Only a fully coordinated system, with elements of risk-information, and integrated inspection and assessment processes can be responsive to the needs of NRC today in fulfilling our regulatory obligations.

For example, in today's system, there is a reasonable balance at the plant level between data collection (inspection) and data analysis (assessment). However, as this information is further analyzed in the regions and ultimately at headquarters, increased emphasis on assessment is disproportionate to additional data collection. This over-analysis of limited data sometimes results in over emphasizing certain events and on added subjectivity.

On the other hand, a policy-driven inspection and assessment system can determine

at each step the safety significance of the event and tie it to licensee performance, and then determine when more source information is needed. I believe that the Senior Management Meeting can be more objectively conducted using better information, while better serving its overriding purpose of providing more timely feedback. Its frequency and scope needs to be adjusted to the Plant Performance Review (PPR) and the 12 month cumulative Plant Issues Matrix (PIM). I believe a new sense of proportion is needed using today's data bases for a sense of proportion, in which the highest priority is given to the most serious problems, and greater clarity is given to the way we describe and categorize issues, as well as the manner by which we disclose the results to the public.

I have heard the arguments: this sounds great, but where are the resources? Well, it certainly cannot be done with business as usual. Courage and vision are needed to eliminate the unnecessary, improve the implementation and better plan our activities. We do not need additional resources to do what I suggest; we need rather to re-prioritize the resources we have to focus on risk and efficiency.

This brings me to one of my greatest concerns during my brief tenure as an NRC Commissioner: our communications and especially, our communications with the public. We need to significantly improve the quality of our communications to the people. Our dedication to public disclosure is excellent, but without the proper safety perspective, it can at times do more harm than good. We use vague terms like "weakness," "lack of sensitivity," "lack of a questioning attitude," to describe a range of licensee performance deficiencies. These terms lack precision and clarity, and they give the impression that the NRC itself is not clear as to what the problem is. The typical SALP report could easily be a teaching manual to confusionists. These are not disciples of Confucius. "In general the plant was well operated, however..." A well operated plant is what NRC is supposed to want, but somehow it is not good enough because the plant could do better. At other times it appears that NRC has found a scapegoat for all problems, "the management" who is blamed for mechanical, electrical, or human failures, whether or not they are responsible.

My most serious concern is not the effect this has on the industry, but the effect imprecise communication has on the American people. If you study the last six months of nuclear related news coverage, you might come to the conclusion that nuclear power plants are bursting at the seams, just about to explode, sending a radioactive cloud into every home. Yet, this is not true: the nuclear industry's overall safety record is clear, and it is good.

Do we have plants with serious deficiencies in administrative controls? Yes.

Were several nuclear plants lax in their obligation to maintain an adequate design basis for their structures, systems, and components? Yes.

Did the NRC miss it too? YES.

Have nuclear power plant licensees and the NRC failed to ensure "adequate protection" resulting in increased radiological risk? No.

Do nuclear power plants pose an immediate danger to the communities they serve? No. Is this clearly understood by the public? NO!

We must realize that we are NOT serving the American public with imprecise disclosures that create fear and distrust. To discharge our duty to the people of this country requires due consideration and control of our communications, reflecting the facts and unbiased analyses, without speculation, extrapolation, or imagination. The NRC should not call press conferences to satisfy the media, but to fulfill our obligation to the American people; this requires excellent preparation and our best efforts.

While I have focused primarily today on the duties of the regulator, I do not for a moment mean to diminish the responsibilities of licensees. There should be no mistake: the primary responsibility for safe operation rests, as always, with the licensee. But, we at the NRC need to be as demanding of ourselves as we are of the industry; not because it helps the industry, but because it is our duty to the American people. For the responsibilities of the regulators and the regulated are inextricably linked. Our licensee's ability to discharge their responsibilities with maximum effectiveness depends on NRC performing its own duties with equal effectiveness.

Before I summarize, let me add a suggestion for the Regulatory Information Conference in 1998. Add a section on what is done right!

In summary, I have outlined three common objectives for serious consideration by NRC and industry:

- 1) to develop the capability to differentiate routinely between issues of higher and lower safety significance, and to use this to resolve the current regulatory quagmire;
- 2) to establish sensible priorities, so that resources are applied where they are needed most; and
- 3) to provide clarity and specificity in the way that we communicate.

In this way, we can help assure that all of us here -- the regulators and the regulated -- contribute to the quality of life of the American people. I believe that these are achievable objectives. But, as Chairman Jackson often says, "the proof is in the action, not in the words." I look forward to working with you to transform these concepts into a functional part of our drive to regulatory excellence. I will conclude by paraphrasing Cardinal Newman who said

To be better, you have to change.

To be the best, you have to change often.

Thank you.

**NOTE: THE COMPLETE TEXT VERSION WITH GRAPHICS CAN BE FOUND ON THE**

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